

**I3A214-235P is a new generation module that combines electrical and thermal energy production. The photovoltaic module is combined with an aluminum collector that directs the exceeding heat, generated from solar radiation and from the normal operation (Joule effect), to a fluid that flows in the collector.**

### Properties

This system is particularly suitable for those that want to install a photovoltaic system with high performance and need for thermal energy (sanitary water, domestic heating, etc.).

Using a hydraulic connection with a heat exchanger and a water tank, the hybrid system will preheat the water supply to the boiler or to an underfloor heating system; moreover it can heat swimming pools and like.

### PV module: characteristics

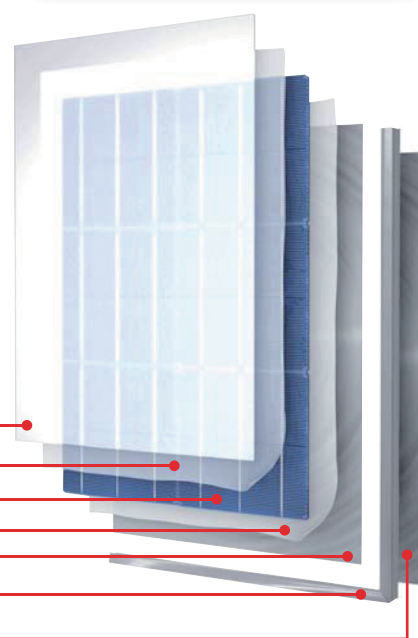
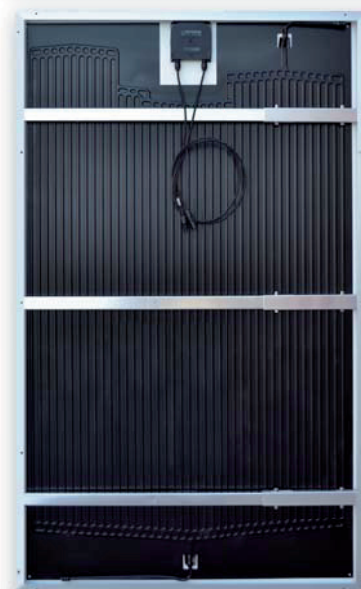
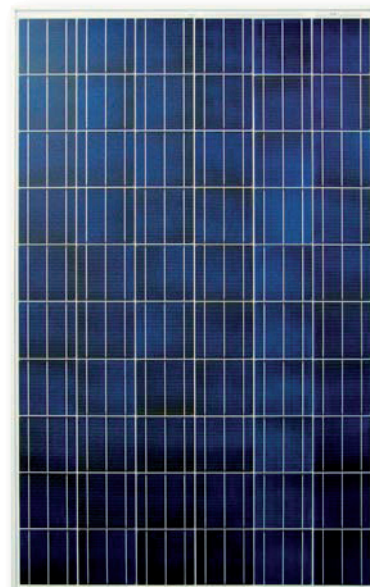
- Module manufactured with 60 C6BA high-efficiency poly-crystalline silicon cells, produced in Italy by Helios Technology
- New 3 bus bar cells that allow a considerable increase in the average module power output
- Long term stability of the electrical performances, by utilizing first-quality raw materials only and crystalline silicon technology
- 0/+ 5 W output power tolerance only, in order to minimize the mismatch losses
- Great spectral response and excellent behaviour under low irradiances thanks to an advanced cells and modules production technology
- New mounting system framework that allows greater regularity and precision of the distances between the sides and diagonals of the module
- Resistance to snow/wind load certified for the module's fixing both in long side or short side
- Redesigned Junction Box with cables and fast connectors suitable for any kind of configuration
- Frame with holes for optical fiber of the Helios Technology antitheft system

### The thermal part: performances

The thermal power provided by the system depends on: temperature gradient, room temperature, the conditions of radiation and other factors; it is approximately 500 Wt per module (total area 1,6 m<sup>2</sup>).

### Certifications and warranties

- UNI EN 12975/6
- CEI EN 61215 (2006) for heavy wind - snow loads
- CEI EN 61730-1-2 (2007) Safety Class II up to 1000 VDC
- 10 years warranty on defective materials and workmanship for PV components
- Output power warranty:  $\geq 90\%$  in 10 years and  $\geq 80\%$  in 25 years



1. Front glass

2. EVA

3. Cells HELIOS TECHNOLOGY-Italy

4. EVA

5. Backsheet

6. Frame

7. Collector



+ 10% INCENTIVE  
RATE



## Electrical Characteristics

at STC (1000 W/m <sup>2</sup> - AM 1,5 - 25°C)						
MODULE		I3A214P	I3A220P	I3A225P	I3A230P	I3A235P
Module power (P <sub>max</sub> )	Wp	214	220	225	230	235
Maximum power voltage (V <sub>pmax</sub> )	V	28,93	29,14	29,64	30,20	30,72
Maximum power current (I <sub>pmax</sub> )	A	7,40	7,55	7,59	7,62	7,65
Open circuit voltage (V <sub>oc</sub> )	V	36,81	36,93	37,15	37,24	37,33
Short circuit current (I <sub>sc</sub> )	A	7,97	8,06	8,14	8,22	8,30
Module efficiency	%	13,2	13,5	13,8	14,1	14,4
Cells efficiency	%	14,8	15,1	15,4	15,8	16,1
Fill factor	%	73,0	73,9	74,4	75,1	75,8
Maximum system voltage	VDC	1000	1000	1000	1000	1000
Power tolerance	W	0/+ 5	0/+ 5	0/+ 5	0/+ 5	0/+ 5

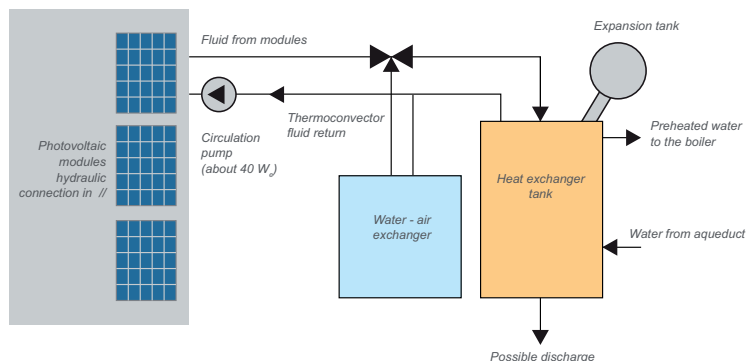
Measurement uncertainty +/- 2%

## Physical characteristics

MODULE	WITH FRAME
Length	1650 ± 1 mm
Width	990 ± 1 mm
Thickness	38 mm
Front Glass	Low Fe content glass 3,2 mm
Encapsulant	EVA (Ethylene-Vinyl Acetate)
Backsheet	Polyester based multi-layer
Frame	Anodized Al 6060 T5 - 15 µm
Junction box	Tyco® or Compel®, IP65, with 3 by-pass diodes
Connection cables section	1,2 m with two Tyco® or Compel® connectors, 4 mm <sup>2</sup>
Thermal collector	Aluminium, designed by Helios Technology 1595 x 935 x 1,5 mm

## Photovoltaic - thermal system main components

- I3A214-235P hybrid module;
- tank for the hot water produced by the system;
- the hydraulic circuit: it transfers the heat from the module to the tank and from this one to the users (inside collectors flows a never-freezing fluid);
- an electrical circuit, which includes a pump for water and a temperature control unit, normally used in solar thermal field.



## System example

$$P_{\text{installed}} = 2.99 \text{ kW}_e$$

$$T_{\text{amb}} = 18^\circ\text{C}$$

$$N. \text{ Mod.} = 13 \times 230 \text{ W}$$

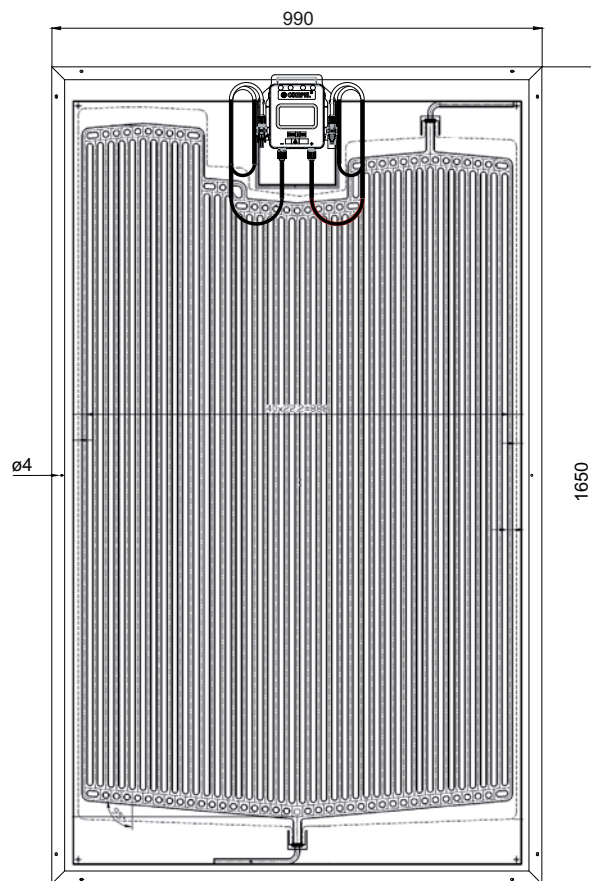
With a normal irradiance the  $T_{\text{mod}}$  is around 44 °C, with the hybrid system  $T_{\text{mod}} = 34^\circ\text{C}$ .

The power increase is around 10 W per module; so  $13 \times 10 = 130 \text{ W}_e$ .

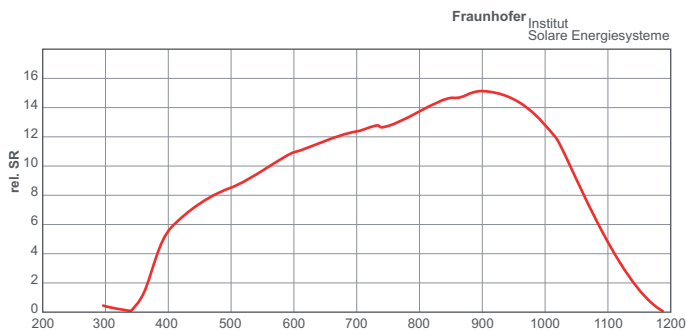
The system produces additional 130  $\text{W}_e$ ; the pump consumes around 40  $\text{W}_e$ . The difference is positive and it is around + 90  $\text{W}_e$ .

## Thermal Characteristics

MODULE	I3A214-235P	
Power (P <sub>t</sub> )	W <sub>t</sub>	500
Internal thermal convector fluid volume (v)	ml	1500
Pressure (p)	bar	2
Coolant	water and glycole mixture (30% Antifrogen SOL VP1981 70% water)	
Circuit type on module	self draining	
Layout	Helios Technology property	
In/out pipe	mm	12



## Spectral response I3A220P



Helios Technology S.p.A.

Via Postumia, 9/B  
35010 Carmignano  
di Brenta (PD) - Italy

Tel. +39.049.9430288  
Fax +39.049.9430323  
info@heliotechnology.com  
www.heliotechnology.com

